



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/551,273	04/18/2000	Nozomu Saito	9333/237	1986

757 7590 05/04/2005

BRINKS HOFER GILSON & LIONE
P.O. BOX 10395
CHICAGO, IL 60610

EXAMINER

LAO, LUN S

ART UNIT	PAPER NUMBER
----------	--------------

2643

DATE MAILED: 05/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/551,273

Applicant(s)

SAITO ET AL.

Examiner

Lun-See Lao

Art Unit

2643

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,8,9,11-17 and 20-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,8,9,11-17 and 20-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Introduction

1 This action is response to the amendment filed on 11-04-2004. Claims 1, 8, 13, - 14, 22 and 26 have been amended. Claims 5-7, 10, 18 and 19 have been canceled. Claims 1-4, 8, 9, 11-17, 20-29 are pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki (US PAT. 5,471,538) in view of Andrea (US PAT. 6,061,456).

Consider claim 1, Sasaki teaches a microphone system that executes an adaptive signal processing by using output signals from two microphones (see fig.2 (11,21)) and outputs a sound signal with an improved SN ratio (see col.1 line 59-col.2 line 3), the microphone system comprising two microphones (11,21) having directional characteristics, wherein the microphones are positioned relatively close to one another, and the angles (see fig.6) formed by the orientations of the microphones with respect to a sound signal direction are different for each of the microphones (see col.6 lines 13-28).

While Sasaki does not explicitly teach that the sound signal (sound coming from the direction of an object, col. 1, lines 8-16) (sound signal, col. 3, lines 1, 7, 56; col. 5,

lines 27-37) is a speaker's voice, Sasaki teaches that the apparatus is a camcorder (col. 7, lines 58-64), which is typically used to record a speaker's voice. Placing the microphones are positioned in front of and above the position of the speaker's mouth by approximately the same distance would have been obvious for the operation of Sasaki.

Therefore, it would have been obvious to include a speaker's voice into the sound signal of Sasaki. When the teaching is modified as such, the sound signal direction would have been the speaker's vocalizing direction.

Sasaki does not explicitly teach that the angle formed by the orientation of one microphone with respect to the speaker's vocalizing direction is set to approximately 0° , and that the angle formed by the orientation of the other microphone with respect to the speaker's vocalizing direction is set to approximately 45° .

Andrea teaches the angle formed by the orientation of one microphone with respect to the speaker's vocalizing direction is set to approximately 0° (speaker' mouth (see fig.3b, (12)). As to the orientation of another microphone to form an angle of approximately 45° (between 12 and 14) with respect to the speaker's vocalizing direction, the microphones of Andrea (see fig.3b and col.14 line 48). On the other hand, Andrea teaches both microphones are positioned in front of and above the position of the speaker's mouth by approximately the same distance (such as, the user wears a headset to speak to the microphones and see fig.9c and col.19 line 65-col.20 line 41).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Sasaki with Andrea to provide an active noise cancellation apparatus and active noise reduction apparatus which reduce background noise to an acceptable level.

Art Unit: 2643

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki (US PAT. 5,471,538) as modified by Andrea (US PAT. 6,061,456) as applied to claim 1 above, and further in view of Miwa (JP 08-040070).

Consider claim 2, Sasaki and Andrea fail to disclose a microphone is mounted on the sun visor of a vehicle.

However, Miwa teaches a microphone is mounted on the sun visor of a vehicle (see constitution).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Sasaki and Andrea, with Miwa to provide the microphone arranged close to the narrow side of the sun visor facing away from the speaker/listener at only a very small distance from the sun visor.

5. Claims 3, 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki (US PAT. 5,471,538) as modified by Andrea (US PAT. 6,061,456) as applied to claim 1 above, and further in view of Romesburg (US PAT. 5,796,819).

Consider claims 3-4, Sasaki and Andrea fail to teach a microphone system, wherein the microphones are mounted on the ceiling above the driver's seat of a vehicle; and the microphones are mounted on the ceiling above the front passenger seat of a vehicle.

However, Romesburg teaches a microphone system, wherein the microphones (see fig.8 (22,36)) are mounted on near the ceiling above the driver's seat of a vehicle; and the microphones (see fig.8 (22,36)) are mounted on near the ceiling above the front passenger seat of a vehicle.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Romesburg into the teaching of

Art Unit: 2643

Sasaki and Andrea to provide the microphone apparatus having better directional sound.

6. Claims 8, 11-12, 21-22, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki (US PAT. 5,471,538) in view of Andrea (US PAT. 6,061,456) and Miura (JP 61028294).

Consider claim 8, Sasaki teaches a microphone system comprising two microphones having directional characteristics (see fig.3), an adaptive filter (see fig.2 (24)) that simulates a noise signal outputted from one microphone (21) by using a noise signal outputted from the other microphone (11), and a calculation means (see col.3 line 11-col.4 line 65) that calculates a difference between these two noise signals, wherein the two microphones (11,21) are positioned substantially adjacently, and angles (see fig.6) formed by the orientations of the microphones with respect to a speaker's vocalizing direction are different for each of the microphones (see col.6 line 13-28).

While Sasaki does not explicitly teach that the sound signal (sound coming from the direction of an object, col. 1, lines 8-16) (sound signal, col. 3, lines 1, 7, 56; col. 5, lines 27-37) is a speaker's voice, Sasaki teaches that the apparatus is a camcorder (col. 7, lines 58-64), which is typically used to record a speaker's voice. Therefore, it would have been obvious to include a speaker's voice into the sound signal of Sasaki. When the teaching is modified as such, the sound signal direction would have been the speaker's vocalizing direction.

Sasaki does not explicitly teach the two microphones are spaced apart approximately 9 cm, both microphone are positioned in front of and above the position of a speaker's mouth by approximately the same distance, and the angle formed by the orientation of one microphone with respect to the speaker's vocalizing direction is set to

Art Unit: 2643

approximately 0° , and the angle formed by the orientation of the other microphone with respect to the speaker's vocalizing direction is set to approximately 60° .

However, Andrea teaches both microphones are positioned in front of and above the position of a speaker's mouth by approximately the same distance (such as, the user hands on a telephone set to speak to the microphones and see fig.3b,(12,14) and col.13 line 15-col.14 line 67); and the angle formed by the orientation of one microphone with respect to the speaker's vocalizing direction is set to approximately 0° (when the speaker's mouth face to the microphone (fig.3b, (12))), and the angle formed by the orientation of the other microphone with respect to the speaker's vocalizing direction is set to approximately 60° (14 (between MIC12 and MIC14 and see col.14 line 7-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Sasaki with Andrea to provide an active noise cancellation apparatus and active noise reduction apparatus which reduce background noise to an acceptable.

On the other hand, Miura teach the two microphone are space apart approximately 9cm (see figs1-2 and constitution).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Sasaki with Miura to improve low frequency respond.

Consider claims 11-12, Sasaki teaches a microphone system further comprising a filter processing means that updates inherently (such as changing the tap) filter coefficients (weight vector) of the adaptive filter (see col.9 line 50-col.10 line 15); and the filter processing means receives a voice signal outputted from a microphone and a difference signal outputted from the calculation means, and updates inherently (such as

Art Unit: 2643

changing the tap) the filter coefficients of the adaptive filter so as to minimize a power of the difference signal by using the LMS algorithm (see col.9 line 50-col.10 line 15).

Consider claim 21, Miura teaches a microphone system of the distance between the two microphones is about 9 cm (see figs.1-2 and constitution).

Consider claim 22, Sasaki teaches a microphone system that executes an adaptive signal processing by using output signals from two microphones (see fig.2 (11,21)) and outputs a speaker's voice signal with an improved SN ratio (see col.1 line 59-col.2 line 3), the system comprising two directional microphones (11,21) (see col.6 lines 13-28).

While Sasaki does not explicitly teach that the sound signal (sound coming from the direction of an object, col. 1, lines 8-16) (sound signal, col. 3, lines 1, 7, 56; col. 5, lines 27-37) is a speaker's voice, Sasaki teaches that the apparatus is a camcorder (col. 7, lines 58-64), which is typically used to record a speaker's voice.

Therefore, it would have been obvious to include a speaker's voice into the sound signal of Sasaki. When the teaching is modified as such, the sound signal direction would have been the speaker's vocalizing direction.

Sasaki does not explicitly teach that the both microphones are positioned above and to one side of the position of a speaker's mouth by approximately the same distance, are oriented substantially perpendicularly to the speaker's vocalizing direction and are spaced apart from one another in the vocalizing direction by approximately 7.5 cm.

Andrea teaches that a microphone system, wherein both microphones are positioned above and to one side of the position of a speaker's mouth by approximately the same distance (fig. 3), microphone 12,14) and the microphones are oriented substantially perpendicularly to the speaker's vocalizing direction; the microphones of Andrea (fig.3b (12,14)) are mounted on the telephone handset. as the telephone

Art Unit: 2643

handset (see figs 1. 3b (12,14)) is rotated upwards and downwards on the hand, the axes of the microphones move in the opposite direction over a wide range of angles with respect to the speaker (represented by direction to front of speaker. Obviously, substantially perpendicularly to the speaker's vocalizing direction would have been formed during such rotations (see fig.3b (from microphones 12,14) and col.13 line 15-col.14 line 67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Sasaki with Andrea to provide the supporting member traverses an angular range, within which the main reception direction of the microphones intersects the handset.

Miura teaches both microphones space apart from one another in the vocalizing direction by approximately 7.5 cm (see figs. 1-2 and constitution).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Sasaki with Miura to improve low frequency respond.

Consider claim 26, Sasaki teaches a microphone system that executes an adaptive signal processing by using output signals from two microphones (see fig.2 (11,21)) and outputs a speaker's voice signal with an improved SN ratio (see col.1 line 59-col.2 line 3), the system comprising two directional microphones (11,21); wherein one microphone is oriented substantially perpendicularly to the speaker's vocalizing direction, the other microphone is oriented at an acute angle relative to the orientation of the one microphone (see figs.3,6-7 and col.6 lines 13-28), and the microphones are spaced apart from one another in the vocalizing direction by about 2 cm (see fig.8, d and col.6 line 48-col.7 line 49 and claim1 (first microphone and second microphone are adjacent to each other)).

While Sasaki does not explicitly teach that the speaker's voice signal (sound coming from the direction of an object, col. 1, lines 8-16) (sound signal, col. 3, lines 1, 7, 56; col. 5, lines 27-37) is a speaker's voice, Sasaki teaches that the apparatus is a camcorder (col. 7, lines 58-64), which is typically used to record a speaker's voice.

Therefore, it would have been obvious to include a speaker's voice into the sound signal of Sasaki. When the teaching is modified as such, the sound signal direction would have been the speaker's vocalizing direction.

While Sasaki does not teach both microphones are positioned above and to one side of the position of a speaker's mouth by approximately the same distance.

However, Andrea teaches that the microphones are oriented substantially perpendicularly to the speaker's vocalizing direction(see fig.3b); the microphones of Andrea (fig.9c (302,300 both microphones)) are mounted on the headset. as the headset (see fig.9c 302) is rotated upwards and downwards on the hinge, the axes of the microphones move in the opposite direction over a wide range of angles with respect to the speaker (represented by direction to front of speaker. Obviously, substantially perpendicularly to the speaker's both microphones are positioned above and to one side of the position of a speaker's mouth by approximately the same distance (see fig.9c (from microphones 302 to 450) and col.19 line 65-col.20 line 41) and the microphones are spaced apart from one another in the vocalizing direction by about 2cm (see col. 19 lines 29-55).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Sasaki with Andrea to provide an active noise cancellation apparatus and active noise reduction apparatus which reduce background noise to an acceptable level.

On the other hand Miura teaches two directional microphone (see fig.2 and abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Sasaki with Miura to improve low frequency respond.

7. Claims 9 and 23, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki (US PAT. 5,471,538) as modified by Andrea (US PAT. 6,061,456) and Miura (JP 6102829) as applied to claim 8, 26 above, and further in view of Miwa (JP 08-040070).

Consider claim 9, Sasaki and Andrea fail to disclose a microphone is mounted on the sun visor of a vehicle.

However, Miwa teaches a microphone is mounted on the sun visor of a vehicle (see constitution).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Sasaki and Andrea, Miura with Miwa to provide the microphone arranged close to the narrow side of the sun visor facing away from the speaker/listener at only a very small distance from the sun visor.

Consider claim 23, note discussion of claim 9.

Consider claim 27, note discussion of claim 9.

8. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Romesburg (US PAT. 5,796,819) in view of Hosoi (US PAT. 5,754,665).

Consider claim 13, Romesburg teaches a microphone system (see fig.2) that executes an adaptive (28,30) signal processing by using output signals from two microphones (22,26) and outputs a speaker's voice signal with an improved SN ratio, wherein the microphones (22,26) are positioned close to one another, and the SN ratio

of the output signal from one microphone is raised (inherent, because one microphone is closer and other microphone is farther from a speaker) while the SN ratio of the output signal from the other microphone is lowered (see col.5 line 10-38); but Romesburg does not clearly teach a first adaptive signal processor receives an output signal from one microphone and an error signal and provides an output signal to a subtracter, a second adaptive signal processor receives an output signal from the other microphone and said error signal and provides an output signal to said subtracter, and the subtracter outputs said error signal as difference between said output signals, the first and second adaptive signal processors executing adaptive signal processing to minimize the power of said error signal .

However, Hosoi teaches a first adaptive (see fig.3, 13) signal processor receives an output signal from one microphone (2) and an error signal (104) and provides an output signal to a subtracter (15 (adder, but the negative sign from adaptive filter (13), therefore the adder 15 becomes subtracter), a second adaptive (14) signal processor receives an output signal from the other microphone (3) and said error signal (105) and provides an output signal to said subtracter (16 (adder, but the negative sign from adaptive filter (14), therefore the adder 16 becomes subtracter), and the subtracter (15,16 (adder) but the negative sign from adaptive filters (13,14), therefore the adders 15 16 becomes subtracter) outputs said error signal (104,105) as a difference said output signals (103), the first and second adaptive signal processors (13,14) executing adaptive signal processing to minimize the power of said error signal (104,105) and see col.2 line 46-col.3 line 20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Romesburg with Hosoi to improve

Art Unit: 2643

characterics by lessening the effect upon the voice signal caused by voice picked by the noise microphone, and simultaneously reducing the noise component to a minimum.

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Romesburg (US PAT. 5,796,819) as modified by Hosoi (US PAT.5,754,665) as applied to claim 13 above, and further in view of Walters (US PAT.5,442,813).

Consider claim 14, Romesburg teaches a microphone (see fig.2,22) is disposed almost directly above the face of a speaker (4), but Romesburg does not clearly teach both microphone are positioned at about the same height above a speaker's mouth.

However, Walter teaches both microphone (see fig.2, 2-4) are positioned at about the same height above a speaker's mouth (see figs 2-4 and col.4 line 24-51).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching Walters into the Romesburg with Hosoi to provide the greater the number of the microphones used, the more effective a noise suppression system will be.

10. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Romesburg (US PAT. 5,796,819) as modified by Hosoi (US PAT.5,754,665) and Walters (US PAT. 5,442,813) as applied to claims 13-14 above, and further in view of Lange (EP 457,176) and Miura (JP 61028294).

Consider claims 15-16, Romesburg and Hosoi, Waltes fail to teach a microphone system of the other microphone is spaced apart on the occipital side from the position of the one microphone; and a microphone system of the other microphone is spaced apart on the occipital side by about 1 to 5 cm from the position of the one microphone.

Art Unit: 2643

However, Lange teaches a microphone system wherein the other microphone is spaced apart on the occipital side (see fig.1 (1a)) from the position of the one microphone (1a, between the driver with two 1a microphones);

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Romesburg and Hosoi, Walters with Lange to provide the microphone apparatus having better noise cancellation.

On the other hand, Romesburg, Hosoi, Walters and Lange does not clearly teach a microphone system of the other microphone is spaced apart by about 1 to 5 cm from the position of the one microphone, but Miura teaches a microphone system of the other microphone is spaced apart by about 1 to 5 cm from the position of the one microphone (see figs. 1-2 and constitution)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Miura into the teaching of Romesburg and Hosoi, Walters with Lange to improve low frequency respond.

11. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Romesburg (US PAT. 5,796,819) in view of Lange (EP 457,176).

Consider claim 17, Romesburg teaches an in vehicle microphone system comprising two microphones (see figs.8,9 (22,36)) positioned inherently at a height above a speaker's mouth, an adaptive filter (see figs. 3-7, (42,14,40,32)) that simulates a noise signal outputted from one microphone by using a noise signal outputted from the other microphone, and a calculation means (see col.10 line 10-60) that calculates a difference between these two noise signals, wherein one microphone (22) is disposed substantially directly above the face of a speaker (see col.10 line 10-60).

Romesburg does not teach the other microphone is spaced apart on the occipital side by about 1 to 5 cm from the position of the one microphone.

However, Lange teaches that one microphone (see fig.1, 1a) is disposed substantially directly above the face of a speaker (driver), wherein the other microphone is spaced apart on the occipital side (see fig.1 (1a) from the back of the driver) by from the position of the one microphone (1a from front of the driver).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Romesburg with Lange to provide the microphone apparatus having better noise cancellation.

On the other hand, Lange does not clearly teach between two microphones distance about 1-5cm, However, it is well-known in the art to replacing microphone in different distance. Therefore, it would have been obvious that Romesburg and Lange could have the distance between two microphones such as 1-5cm for market demand.

12. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Romesburg (US PAT. 5,796,819) modified by Lange (EP 457,176) as applied to claim 17 above, and further in view of Yoshida (US PAT. 5,473,702).

Consider claim 20, Romesburg and Lange fail to teach that a microphone system determines filter coefficients of the adaptive filter by an adaptive signal processing during a period of non-recognition of a voice, does not update the filter coefficients during a period of recognition of a voice, and sets the filter coefficients determined during the non-recognition of a voice to the adaptive filter.

However, Yoshida teaches that a microphone system determines filter coefficients of the adaptive filter by an adaptive signal processing during a period of non-recognition of a voice, does not update the filter coefficients (such as control signal

Art Unit: 2643

ck) during a period of recognition of a voice, and sets the filter coefficients determined during the non-recognition of a voice to the adaptive filter (col.8 line 30-col.9 line 6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Romesburg and Lange into the teaching of Yoshida to provide an echo canceller to enable a noise canceller to adapt automatically to changes in background noise level.

13. Claims 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki (US PAT. 5,471,538) as modified by Andrea (US PAT. 6,061,456) and Miura (JP6102829) as applied to claim 22 above, and further in view of Romesburg (US PAT. 5,796,819).

Consider claims 24-25, Sasaki and Andrea, Miura fail to teach a microphone system, wherein the microphones are mounted on the ceiling above the driver's seat of a vehicle; and the microphones are mounted on the ceiling above the front passenger seat of a vehicle.

However, Romesburg teaches a microphone system, wherein the microphones (see fig.8 (22,36)) are mounted on near the ceiling above the driver's seat of a vehicle; and the microphones (see fig.8 (22,36)) are mounted on near the ceiling above the front passenger seat of a vehicle.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Sasaki and Andrea, Miura into the teaching of Romesburg to provide the microphone apparatus having better directional sound.

14. Claims 28, 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki (US PAT. 5,471,538) in view of Andrea (US PAT. 6,061,456) and Miura (JP61028294) as applied to claim 26 and further in view of Romesburg (US PAT. 5,796,819).

Consider claims 28-29, Sasaki and Andrea fail to teach a microphone system wherein the microphones are mounted on the ceiling above the driver's seat of a vehicle; and the microphones are mounted on the ceiling above the front passenger seat of a vehicle.

However, Romesburg teaches a microphone system wherein the microphones (see fig.8 (22,36)) are mounted on near the ceiling above the driver's seat of a vehicle; and the microphones (see fig.8 (22,36)) are mounted on near the ceiling above the front passenger seat of a vehicle.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Sasaki and Andrea, Miura into the teaching of Romesburg to provide the microphone apparatus having better direction sound.

Response to Arguments

15. Applicant's arguments filed 4-26-2004 have been considered but are moot in view of the new ground(s) of rejection.

Regarding the argued configuration that the both microphones are at approximately same distance in front of and above the position of the speaker's mouth (claims 1, 8), (remarks, page 7, 3rd paragraph), this is now met by Andrea. Note discussion of claim 1 for detail.

Art Unit: 2643

Regarding the argued configuration that the both microphones are positioned above and to one side of the position of a speaker's mouth by approximately the same distance (claim 26), (remarks, page 11, 4th paragraph), this is now met by Andrea. Note rejection of claim 26 for detailed discussion.

Regarding the argued configuration that one microphones is positioned substantially directly above the face of a speaker and the other microphone is spaced apart on the occipital side by about 1-5 cm (remarks, paragraph bridging pages 9 and 10), the examiner respectfully disagrees. In Lange, microphone 1a mounted on the front corner of the seating is positioned substantially directly above the face of the speaker (front seat passenger) considering the car seat is typically moved forwards and backwards. The other microphone in Lange, microphone 1b, is spaced apart on the occipital side (fig.1, 1b is positioned near the back side of the head of the front seat passenger). The distance between such two microphones 1a and 1b is about 1 to 5 cm, considering the typical size of a car and passenger. Note rejection of claim 17 for detailed discussion.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 2643

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

17. Any response to this action should be mailed to:

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
Facsimile responses should be faxed to:
(703) 872-9306
Hand-delivered responses should be brought to:
Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lao,Lun-See whose telephone number is (571) 272-7501. The examiner can normally be reached on Monday-Friday from 8:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz, can be reached on (571) 272-7499.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 whose telephone number is (571) 272-2600.

Application/Control Number: 09/551,273

Page 19

Art Unit: 2643

Lao, Lun-See
Patent Examiner
US Patent and Trademark Office
Knox
571-272-7501


DUC NGUYEN
PRIMARY EXAMINER